

Advantages of strong cation exchangers vs. weak cation exchangers

When developing a cation exchange method one has to make the decision whether to use a strong or a weak exchanger. Strong cation exchangers (SCX) show a huge advantage over weak cation exchangers (WCX) because they are fully charged over a broader pH range.

Weak ion exchangers are ionised only over a limited pH range while strong exchangers don't show any variation in ion exchange capacity when the pH value is changed. Using weak exchangers the exact adjustment of the buffer

pH is of main importance as weak resins can be protonated or deprotonated with a pH change. This variation in charge leads to an alternate selectivity for binding and elution.

By using a SCX column the optimisation of a separation can be notably simpler and the developed method is more robust against small changes.

In some cases, such as in the application below, the use of a SCX column might even result in higher resolution.

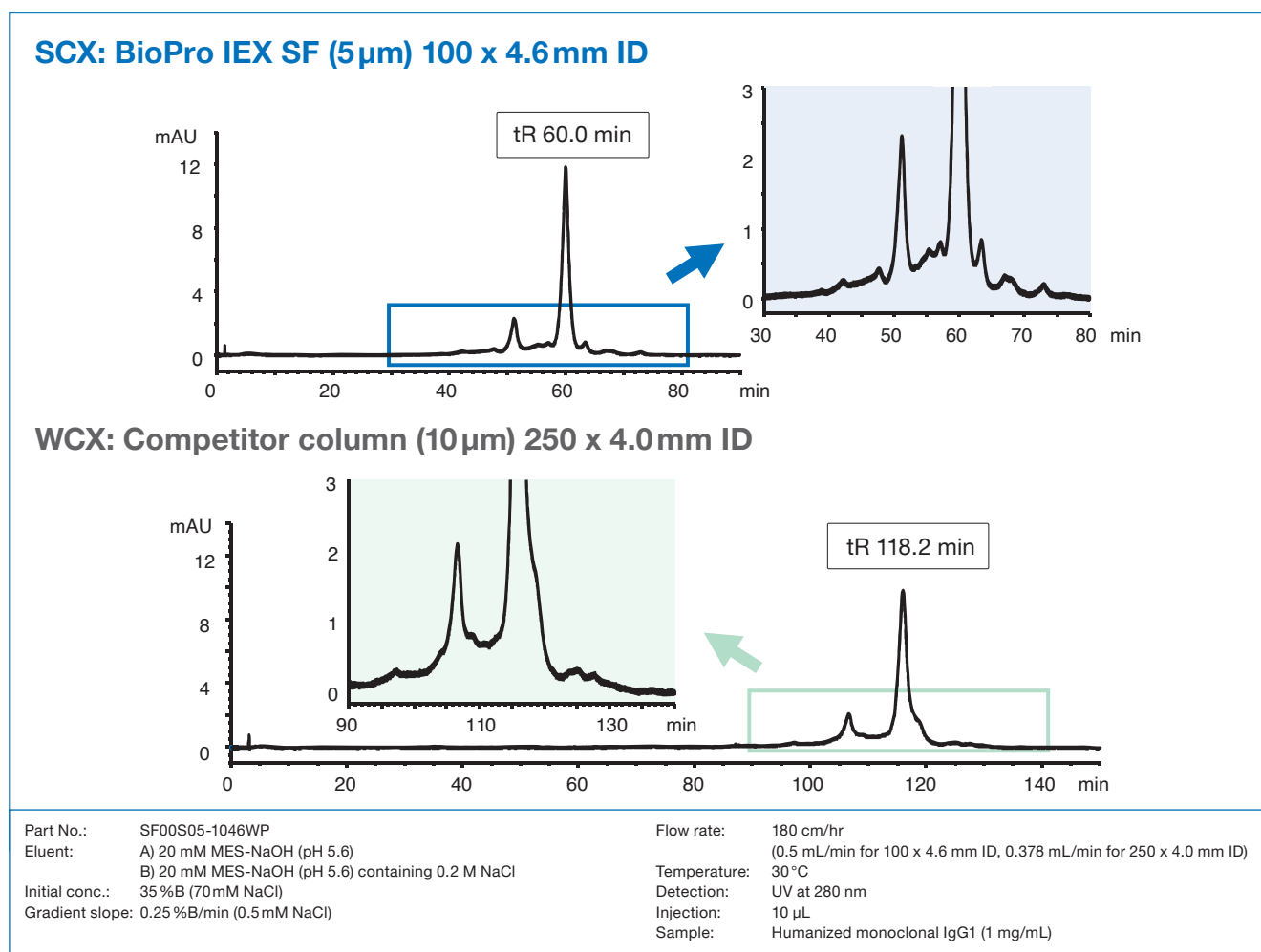


Figure 1: Analysis of a monoclonal antibody IgG1 using the strong cation exchanger BioPro IEX SF (top) and a weak cation exchanger (bottom).

Figure 1 shows the analysis of a monoclonal antibody IgG1 using the SCX column BioPro IEX SF and a WCX alternative. It demonstrates that the use of the SCX column results in a clearly higher resolution and more charge variants can be separated from the main peak. Furthermore,

the run time can be reduced by nearly 50 % in combination with the smaller particle size and a shorter column length. This application shows that an SCX column can not only be a robust alternative for a WCX column, but also provide an improved method!